

Eighth Plenary meeting of the Working Group On Off-Cycle Emissions 21 September 2004, Chicago, USA

Meeting Minutes

Agenda Item 1

- A. Maureen Delaney, the Chairperson of the Off-Cycle Emissions Working Group, opened the meeting by welcoming all of the participants.
- B. The Agenda for the Eighth Plenary Meeting ("Eighth") was reviewed and approved by the membership.

Agenda Item 2

- A. The Chairperson indicated that there is still the open item from the Seventh meeting regarding the discussion of the draft definitions. A goal was set to have a next draft of the definitions available for discussion at the June 2005 plenary meeting. At that point, the draft GTR will have more structure and thus, it will be more appropriate to discuss draft definitions at that time.
- B. The Chairperson announced that OICA has kindly agreed to post the documents of the Off-Cycle working group on its website, so that all participants can have access to electronic versions of those documents. An announcement will be made as to when those documents will be posted.
- C. The Chairperson confirmed that the Editorial Committee has been formed, though there is still opportunity for participation by some key members. Ideally the committee should not have more than 8 members, plus the Chairperson and the Secretariat.
- D. The Chairperson reviewed the timeline that was presented at the Seventh and noted one change. The plenary meeting noted for March 2005 will actually be scheduled for April 2005.
- E. The minutes of the Seventh Plenary Meeting ("Seventh") were reviewed. No comments were received prior to or on the date of the Eighth.
- F. The working group adopted the Minutes of the Seventh Plenary meeting. The final version of the minutes will be submitted to GRPE as an Informal for the 49th Session.

Agenda Item 3

- A. The Chairperson reviewed the outline of the GTR which was prepared by US EPA and circulated prior to the meeting and stated that the goal is to understand the general elements. This draft was prepared using the US EPA regulations as a guide, based on the previous discussions at the plenary level, that the NTE was the only approach at this time to address the issue of off-cycle emissions. There is a US emphasis in the materials as presented, and thus the group has to make the appropriate amendments to make the document more general.
- B. Looking at items A and B (1 to 4), it makes sense for the Chairs of the OBD, WHDC and OCE working groups to work together on the content of these portions of their respective GTRs, with a goal to have parallel language where possible, though there will be elements which will be unique to the specific GTRs. OICA agreed that this was a reasonable approach.
- C. German UBA asked how this group planned to address Section A.3. Potential Cost Effectiveness. Some assumptions may have to be made at the EC level, though there should be information available from the US. The Chairperson indicated that there may be a range of information we will have to look at, based on the vehicles impacted and the potential emission reductions. In the US, you would be enforcing

an existing rule, so there is no cost effectiveness issue. OICA indicated that this may be an issue where we will require guidance from GRPE. Canada suggested that one way to address this is to look at the cost effectiveness/benefit of having a global requirement versus having various national requirements. Canada indicated that those countries that adopt the GTR **would generally** do their own cost analysis to support adoption of the GTR, and this would certainly be different than the cost analysis we would do as part of this working group. The Chairperson stated that this is an issue which will require further discussion with and clarification from GRPE.

- D. The Chairperson requested the Editorial Committee, where possible, to address the US emphasis and have more generic GTR language.
- E. US EPA indicated that the draft GTR, as a starting point, was organized based on the US version of the NTE. Notations have been made in this first draft where the scope needs to be broadened beyond the US approach.
- F. Section B.5. Performance Requirements. US EPA provided some background information as to how the NTE was developed. Section B.5.1.5 addresses the rounding procedures to be used. In the US ASTM rounding protocols are used, but if this need to be broadened to cover conventions used elsewhere, it should be discussed. OICA indicated that in the ECE regulations, rounding procedures are discussed in R-49. OICA believes that having a rounding procedure in place will be helpful to manufacturers, because in the EU today there is no harmonization and it is up to the individual approval authority. As well, the rounding procedure should be an ISO procedure, not an ASTM procedure. EMA indicated that a related issue is the fact that the GTR will be written with specific units of measurement, so conversion factors will also have to be addressed.

A comment was made regarding Section B.5.2.4 that the reference to EGR-equipped engines is not appropriate. The GTR should not make reference to specific technologies, it must be kept technology neutral.

- G. Section B. 6. Documentation for Application for Compliance. US EPA indicated that the key document is the NTE Compliance Statement, because there is not requirement to submit specific data at the time of certification. Manufacturers are required to keep a record of all data which supports the Statement. US EPA has provided guidance documents to help manufacturers with the collection of data. US EPA does not review the data at the time of certification. OICA expressed concern that this is not consistent with the EU process, where a significant amount of data has to be submitted at the time of certification to the type approval authorities. US EPA stated that there is no specific NTE cycle and because there is a broad range of operation and manufacturers currently take different approaches to satisfying the NTE requirements it will be difficult to designate that type of data that has to be submitted. German UBA suggested that both the compliance statement be required, plus specific data.

The Chairperson stated that if we take this approach, we have to come up with a requirement for specific data collection. OICA stated that we need clear requirements, similar to what is contained in the EU directives, so that manufacturers will know what is required to obtain certification. US EPA stated that it will explore this possibility to have this information as part of the certification process. The problem is that in the US, the NTE is not viewed as a type approval test, but as a real world test, to be run under real world conditions. The goal is to breakaway from the burden of type approval, and to move towards setting a base line which will have to be proved later on. EMA agreed with this statement, and the fact that it gives manufacturers flexibility.

US EPA asked if manufacturers will be more comfortable with a specific requirement for data submission, or do they prefer a requirement which allows them to use their own process and rationale for generating data. OICA expressed concern that while

this may work in the US, it will not work in the EU with the competition between approval authorities. The Chairperson suggested that perhaps the general statement will remain as in the draft GTR, and an Annex can describe the specific data that will have to be gathered. The Japanese indicated that the certification process is similar to that in the EU. OICA stated that manufacturers want to have a checklist, and if everything is completed, the engine will receive certification. Manufacturers do not want to have discussions with the approval authorities, the way it is done in the US today. US EPA stated that the intent of the NTE is to limit those discussion and having an in-use requirement will compel manufacturers to comply.

The Chairperson stated that perhaps the appropriate next consideration is to have an In-Use GTR following the completion of the Off-Cycle GTR. OICA states that this should be brought to the attention of GRPE. EMA expressed concern about the enforcement mechanism with in-use testing and the patchwork effect of different countries. US EPA stated that if there is a minimum requirement for data and manufacturers are still responsible for in-use testing, this may be something to consider. Canada expressed concern that setting the minimum requirement for data, must be coupled with the certification statement to ensure the engineering work has been completed to comply with the NTE requirements. OICA stated that there may be countries that adopt the GTR, but which will not have an in-use requirement, thus the type approval authorities will require some minimum data to show compliance with the NTE.

US EPA asked how differing lab conditions would be met, if have a requirement for minimum data submission. OICA stated that this is an issue, because some countries would not care. US EPA stated that the goal of manufactures is to have a common engine design, therefore have to design for the worst case. OICA stated that it may be difficult for a vehicle to meet all of the worst case conditions. Today, we know that specific devices on vehicles are required for specific operation. The fundamental point is that we need a compliance test that covers the most general conditions rather than the most extreme conditions and it may be difficult for manufacturers to test for all conditions in a laboratory. US EPA stated that they would like to see some of the extreme worldwide conditions that have to be met. An analysis would be very helpful to help look at cost issues and perhaps how to modify the NTE zone for these extreme conditions. The Chairperson said that it is not productive to go review the NTE zone on a country by country basis. In the US there are deficiency provisions, which a manufacturer can utilize to show compliance with the NTE under extreme conditions.

- H. Section B.7.Applicable Ambient Operating Regions. The conditions specified in the draft are the result of a joint effort between engine manufacturers and the US EPA, based on where heavy-duty vehicles spend most of the time and the diesel technology available at the time. While operating in the NTE zone, these are the operating regions, and depending on the option selected correction factors for humidity and temperature apply. The NTE is designed to apply to all temperature, all humidity (with some corrections) conditions and is capped at an altitude of 5500 feet. This approach is based on the US topology, where vehicles spend their time and the engine technology available. OICA stated that we would have to include specific information in the GTR on the correction factors. In the US, EPA will be preparing a guidance document specifically on the correction factors. EMA asked how a manufacturer can show compliance with this GTR. EPA stated that they have seen sound methods for using lab data and engineering judgment to show NTE compliance. The Chairperson stated that there is an issue here on how to address boundary conditions: conditions in the lab versus extreme conditions. This area will require further discussion. In the interest of harmonization, the editorial committee will have to see how to fashion this, to provide guidance for approval authorities.
- I. Section B.8 NTE Deficiencies. Under the US EPA program, this allows a manufacturer to claim compliance with NTE without meeting the NTE limit under all conditions. Initially this was a temporary measure to help address technical

feasibility issues. The deficiencies are granted on a model year basis, with a possibility for extension into a future model year. The reason for this is to enable the US EPA to monitor the progress of the manufacturer in solving the problem. OICA expressed concern that currently, EU approvals are not granted on a model year basis. This is an issue that must be addressed by this working group, if the GTR will require certification on a model year basis or something similar to what is done in the EU. OICA also mentioned that deficiencies are being addressed in the WWH – OBD working group, so perhaps there is something that can be borrowed from that GTR for this GTR. OICA stated that in the EU regulation there are deficiency provisions with respect to the OBD requirements. Manufacturers are given a two year period from the time the deficiency is granted to make progress to enable the engine to fully comply, the assumption being that the type approval authority will then look at the reason for satisfying the deficiency, and will either require data or engineering judgment in support of having full approval without a deficiency. As well the EU has provisions which allow for the retroactive granting of a deficiency. US EPA stated this is not permitted in the US or in this draft GTR. OICA stated that the rationale for allowing a retroactive deficiency is if for example, software issues are discovered at a later point and there is a need to correct this. This was taken from the light-duty vehicle directive. Canada indicated that with the deficiency provisions, the time limit is not based on a Model Year. The Chairperson stated that though it is not based on a Model Year, it is linked to the standard. The key is to keep a level playing field among manufacturers, so perhaps carrying a deficiency for two years is not appropriate. We need to get a consistent process in place in an effort to align philosophies. The Chairperson stated that there is nothing that requires the deficiencies to be the same for OCE and OBD. US EPA stated that the EPA program allows for up to three deficiencies, but there are provisions which allow the granting of more deficiencies if necessary. We will have to determine in this group what makes sense in terms of this GTR and a worldwide approach. German UBA asked if Deficiency is defined. US EPA stated that there is no definition per se, but a working definition which has evolved over time. German UBA suggested this may be a term we want to define.

- J. Section B.9. Smoke Opacity Requirements. This topic was outside of the scope of discussion for this plenary meeting, because more work needs to be done to articulated the US based program and to move towards a harmonized approach. It will be revisited at a future time.
- K. Section B.10. NTE Test Procedures. The NTE was developed to monitor emission performance over conditions expected to be encountered in a broad range of use. The US EPA explained the NTE zone to the group. What is presented in the draft GTR at 10.2 is more in line with the US EPA program for Model Year 2007. Today, for consent decree manufacturers there is an NTE carve-out for PM, but in 2007, with the use of particulate filters, there is no PM carve-out. The US EPA stated that it would be helpful to understand if special consideration for engine speed and load profiles is needed in this GTR. In section 10.2.4. OICA stated that the 5% is not applicable to engines with manual transmissions. OICA wanted to know how 10.2.4 would be applied in an in-use situation. US EPA agreed that it is unclear how this applied to automatic or manual transmissions and will follow-up on this point. Regarding the applicability of 10.2.4. to an in-use situation, because the NTE grew out of off-cycle emission trade-off for fuel economy. If the best fuel consumption was outside of the carve-out region, the NTE zone would expand to include this area. Manufacturers have to show that 5% BSFC in the NTE zone, if not, the NTE zone would have to be adjusted and the information would be verified in-use. OICA stated that we need to decide if this concept will apply to this GTR. US EPA addressed the exclusion provisions in 10.3. Exclusions are different than deficiencies. An exclusion eliminates sections of the NTE form consideration in the first place. The idea behind this was that it did not seem reasonable or logical to hold manufacturers responsible for compliance in an area where the engine is not going to operate or operate for a significant period of time. Japan asked if the 30 seconds referred to in 10.3.1 is continuous. US EPA responded that it is continuous. Japan stated they will have to review this to see how it can be calculated under Japanese conditions. US EPA agreed that with a lot of transience, you are always in and out of

the NTE zone and it may be hard to get a 30 second reading. Regarding the 5% carve-out in 10.3.3. survey information is used, based on real-world data, to demonstrate that the engine will not operate more than 5% of its operating time in the excluded area. Exclusions have been explained through a guidance document, that US EPA can make available to this group. Exclusions are part of the certification process and establish a baseline of compliance liability. German TUV asked what the parameters are to demonstrate the need for exclusions. US EPA stated that currently it is based on engineering judgment because manufacturers have sophisticated means to accumulate and develop a simulation model. There is a good understanding of how an engine operates under normal use. US EPA has agreed to provide some examples of exclusions to show how they have been applied. Section 10.4. was discussed. In the 2007 timeframe, PM filters will be used to comply with standards. There may be a need to extend the 30 second period to average out emission spikes during a PM regeneration event. 10.4.3. provides additional allowances to address capabilities of after treatment. The NTE does not apply during engine warm-up because the after treatment device is not capable of performing its intended duty. OICA asked US EPA to provide a more detailed explanation for 10.4.3.2 and 10.4.3.3. Ford asked if we have a method to test temperature in-use. US EPA stated the there are three parallel regulations in place: NTE, In-Use and 1065. US EPA asked if this group, as part of its work, wants to establish a field test protocol. German UBA asked what is meant by multi-bed after treatment (10.4.3.3). US EPA stated this is geared towards dual exhaust, dual after treatment systems. Section 10.5 was discussed. Ambient conditions apply to humidity and temperature. 10.5.5.1 references good engineering judgment. US EPA agreed to provide a generic example of how this is used today by manufacturers. Section 10.6 will have to be revised to be technology neutral. Section 10.7 this area very test procedure specific. EU and Japan were asked to explain how the smoke testing differs from the US EPA test. OICA stated it will have to compare it against the ISO procedure.

- L. Canada asked if the scope of the GTR has a general prohibition against defeat strategies, and if not, does this have to be part of the outline, because there is still a desire to have a general prohibition against defeat strategies. OICA stated that since defeat strategies are discussed in the definitions, there is no need to include it in the body of the GTR. The WHDC GTR does not include defeat strategy prohibitions, and neither does the OBD GTR. The Chairperson stated that we have to find a way to reference the general prohibition against defeat strategies because we do not want to lose sight of it.

Agenda Item 4

The editorial committee consists of the following members:

OICA – Mr. Juergen Stein and Mr. Lars Gustavsson

EMA – Mr. Mark Stepper

German UBA – Mr. Stefan Rodt

German TUV – Mr. Winfried Matatko

Canada – Mr. Ed Crupi

Chairperson of the Off-Cycle Working Group

Secretary of the Off-Cycle Working Group

Japan indicated that it will advise within a short period of time who will participate on the editorial committee. Japan also indicated that it want to contribute to the technical discussions. A representative from the EU has yet to be named, since the departure of Paul Greening. Other members are encouraged to join the editorial committee so that a group consisting of no more than 10 individuals can be established.

Once the editorial committee is formed, a decision as to how it will proceed will be made and specific tasks will be assigned. The goal should be to have a solid draft GTR by January. As well a specific timeline for delivery of the GTR will have to be established.

Agenda Items 5

The group's timeline was reviewed.

The next meeting will be an editorial committee meeting in Tokyo for two days in November.

The next plenary meeting will be for a full day in January in conjunction with the 49th session of the GRPE.

The spring meeting is tentatively scheduled for April in Capetown. The group will have to make a decision by the January meeting if the spring meeting will indeed take place in Cape town or if an alternative location will be selected.

The June meeting will take place in conjunction with the 50th session of the GRPE. After June of 2005, the schedule will have to become more flexible depending on the progress of the GTR.

The Chairperson announced that there will be a change in the US representation to GRPE and this group. The individual has not yet been named, but it will be someone from the US EPA Assessment and Standards division. The Chairperson will continue to be involved in the short-term until the transition is made. The Chairperson encouraged all of the members to reach out to the editorial committed with any comments rather than waiting until the next plenary meeting.

Agenda Item 6

The editorial committee will meet on the 8th and 9th of November in Tokyo, Japan. Details of the meeting location will be provided as soon as they are received from our hosts.

The next plenary meeting of the Off-Cycle Working Group will be held on the afternoon of January 10, 2005 from 14:30 to 17:30 at the Palais des Nations in Geneva Switzerland.

Dated this 21st day of June 2004

Joanna Vardas, Secretariat